WHAT IS CLAIMED IS:

1. An apparatus for determining the spring rate of a torsion bar, said apparatus comprising:

a frame having a head end and a tail end and two channels, each of which defines an axis and is configured to receive a torsion bar;

a force applicator mounted on the frame at its head end and including a drive element that is capable of undergoing a displacement from a retracted position to extended positions and exerting a force as it displaces;

a measuring unit mounted on the frame at its tail end and being capable of measuring a force;

a first torque arm configured to couple one end of a torsion bar in one of the channels with the drive element of the force applicator; and

a second torque arm configured to couple with a torsion bar in one of the channels and transmit torque exerted on it to the measuring unit, so that the measuring unit can measure the force derived from the torque.

2. An apparatus according to claim 1 wherein the force applicator is located between the axes of the two channels, and the measuring unit is located between the axes of the two channels.

3. An apparatus according to claim 2 wherein the axes of the two channels cross between the head and tail ends of the frame.

4. An apparatus according to claim 3 wherein the two axes lie in essentially the same plane, and the drive element of the force applicator displaces generally perpendicular to the plane.

5. An apparatus according to claim 1 wherein the first torque arm at one end lies along the axis for the one channel and at its opposite end has a swivel and a force transfer element extended from the swivel and bearing against the drive element of the force applicator.

6. An apparatus according to claim 5 wherein the first torque arm and swivel are configured such that the swivel can be fixed in position on the first torque arm.

7. An apparatus according to claim 6 wherein the drive element has a surface against which the force transfer element of the first toque arm bears.

8. An apparatus according to claim 7 wherein the surface of the drive element contains a depression in which the end of the transfer element initially seats to establish a predetermined distance between the end of the transfer element and the axis of the channel at which said other end of the torque arm is located.

9. An apparatus according to claim 8 wherein the transfer element is an adjusting screw which threads through the swivel.

10. An apparatus according to claim 3 and further comprising first bushings at the head and tail ends of the frame and being aligned to define one of the channels; and second bushings at the head and tail ends of the frame and being aligned to define the other channel.

11. An apparatus according to claim 1 and further comprising: a key that is engageable with the drive element and, when engaged with the drive element, holds the drive element in a predetermined extended position.

12. An apparatus according to claim 11 wherein the drive element of the force applicator is capable of extending beyond the predetermined extended position, so that the

key may be engaged with the drive element, whereupon the drive element will retract no farther than the predetermined extended position.

13. An apparatus according to claim 12 wherein the drive element is also capable of extending only to the predetermined extended position.

14. An apparatus for determining the spring rate of a torsion bar, said apparatus comprising:

a frame having a channel configured to receive a torsion bar;

a force applicator mounted on the frame and having a drive element which is offset from the channel and is capable of undergoing a displacement from a retracted position to extended positions and exerting a force as its displaces, the drive element having a drive surface that contains a depression, but is otherwise substantially flat;

a torque arm configured to couple with the end of a torsion bar received in the channel and to extend from the bar to the drive element and having an adjusting screw , the end of which bears against the drive surface of the drive element; the adjusting screw being initially adjustable laterally with respect to the drive surface so that its end will initially seat in the depression while the drive element is in its retracted position, yet later fixed in position laterally, so that when the drive element moves to an extended position, the end of the adjusting screw will move out of the depression and into the flat position of the drive surface; and

a measuring unit on the frame and being capable of measuring a force derived from a torque applied to a torsion bar in the channel.

15. An apparatus according to claim 14 wherein the torque arm includes a swivel which is capable of limited rotation, and the adjusting screw threads through the swivel.

16. An apparatus according to claim 15 wherein the torque arm contains a bore in which the swivel is located and the torque arm further includes a clamp screw which, when tightened, contracts the bore and fixes the position of the swivel in the torque arm.

17. In combination with a torsion bar having first and second ends, an apparatus for determining the spring rate of the torsion bar, said apparatus comprising:

a frame having a head end and a tail end and first and second channels extending between the head and tail ends, each channel defining an axis and being configured to receive the torsion bar, with the ends of the bar projecting out of the channels, the bar being received in one of the channels with its first end located beyond one end of the channel and its second end located beyond the other end of the channel;

a first torque arm engaged with the first end of the torsion bar;

a second torque arm engaged with the second end of the torsion bar;

a measuring unit mounted on the frame at its tail end and having a sensing element against which the second torque arm bears remote from the torsion bar; and

a force application mounted on the frame at the head end of the frame and including a drive element which moves between retracted and extended positions, the drive element being against the first torque arm remote from the torsion bar in a direction which is resisted by the sensing element of the measuring unit and the second torque arm, whereby the torsion bar is twisted and through the second torque arm exerts a force on the sensing element.

18. The combination according to claim 17 wherein the axes of the two channels cross between the head and tail ends of the frame.

19. The combination according to claim 17 wherein the axes lie in a common plane and the drive element moves generally perpendicular to the plane.

20. The combination according to claim 17 wherein the drive element has a drive surface that contains a depression, but is otherwise generally flat and perpendicular to the direction in which the drive element moves, and the first torque arm includes an adjusting screw having an end which bears against the drive surface of the drive element.

21. The combination according to claim 20 wherein the first torque arm includes a swivel through which the adjusting screw threads so that the screw may be moved to a position in which its end is in the depression in the drive surface of the drive element; and wherein position of the swivel is capable of being fixed in the torque arm.

22. The combination according to claim 21 wherein the first torque arm contains a bore in which the swivel is received, so that the swivel can rotate in the bore such that the end of the adjusting screw is positioned in the depression of the drive element when the drive element is retracted and a clamp screw for contracting the bore and fixing the position of the swivel in the torque arm, so that the distance between the end of the adjusting screw and the axis of the torsion bar will remain the same when the drive element moves to an extended position.

23. The combination according to claim 17 wherein the apparatus for determining the spring rate further includes a key that is engageable with the drive element and, when engaged, will maintain the drive element in a predetermined extended position.

24. The combination according to claim 23 wherein the drive element is capable of extending to and remaining at a fully extended position which is beyond the

predetermined extended position and also extending to and remaining at the predetermined extended position, each without the benefit of the key.